

REMARKS/ARGUMENTS

Applicant has amended the claims in response to the office action for the sake of focusing the subject matter of the claims and advancing prosecution. Support for the claim amendments may be found throughout the specification.

In particular, paragraph 61 on page 13 notes, “[T]he present invention encompasses methods for inhibiting the growth of an organism selected from the group consisting of microbes, insects and nematodes by exposing the organism or its habitat to an effective amount of the following...one of the volatile organic compounds isolatable from Muscodor, described in the Examples section below.” The Examples, in particular Examples 2, 4, 5, 6 and 10 and the Tables within those examples (i.e., Tables 1, 4, 6 and 7), indicate that isobutyric acid is isolatable from Muscodor. Further, the first sentence of Paragraph 62 states: “In preferred embodiments of the invention, inhibition of the growth of microbes, insects, and nematodes is accomplished by exposing the organism or its habitat to an effective amount of...isobutyric acid...” In addition, the final sentence of paragraph 61 gives examples of habitats of the microbes, including containers of post harvest food, stating: “The habitats of the organism will be known to those of skill in the art and include...containers of post harvest food...”

In addition, the examples provide support for the claim amendments. Example 11, which is set forth in paragraph 106 and which was added via a previous amendment, shows how compositions produced by Muscodor, which contain isobutyric acid, are used to inhibit the growth of a fungus, *Penicillium expansum*, in a container of post harvest food (i.e., apples). In addition, Table 11 on page 35 shows the inhibitory and lethal effect

of volatile organic compounds produced by Muscodor, which include isobutyric acid, on a variety of microbes.

Support for the “effective amount” limitation may be found on page 5, paragraph 27, in which an effective amount is defined as an amount sufficient to inhibit the growth of a pest.

Claim Rejections – 35 USC Section 112 (New Matter)

The Examiner rejected Claims 90-100 under 35 U.S.C. Section 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the invention. In particular, the Examiner noted that the recitations “relative ratio” and “at least about 5%” do not clearly set forth the concentrations intended and that ‘at least about 5%’ and ‘less than 2800 ppm’ appear contradictory and inconsistent in this context.” The amended claims do not include these claim elements, thus rendering these rejections moot. Therefore, Applicant requests that this rejection be reconsidered and withdrawn.

Claim Rejections – 35 USC Section 112 (Indefiniteness)

The Examiner also rejected Claims 90-100 under 35 U.S.C. Section 112, second paragraph as being indefinite. In particular, the Examiner alleges that the use of the terms “at least about 5%” and “less than 2800 ppm” are indefinite because they lack an indication of whether the percentage is by weight or volume or what the “parts” pertain

to. As noted above, these terms have been removed from the claims, thereby rendering the rejection moot. Therefore, Applicant requests that this rejection be withdrawn.

Claim Rejection - 35 U.S.C. Section 112 (Enablement)

The Examiner rejected Claims 90-92 and 95-100 under 35 U.S.C. Section 112, first paragraph, for lack of enablement. Specifically, the Examiner asserts:

- 1) The inhibition of bacteria and fungi with volatile compounds is unpredictable particularly when using trace amounts in a composition.
- 2) The specification as filed does not provide sufficient guidelines or teachings for the inhibition of any and all bacteria or fungi that contaminate any food container or buildings as claimed.
- 3) The size of the “container” cannot be ascertained. It is noted that large, room size “containers” are placed on a ship.
- 4) The guidance provided in the specification is not adequate to lead persons of skill in the art toward success in inhibiting all the organisms recited in the process encompassed by the claims in a predictable manner, because the effects of single compounds are not set forth with any particularity and the amounts required for effectiveness are not specified with sufficient particularity.

As to point #1, above, Applicant notes that those of ordinary skill in the art have long known that minute amounts of volatile organic compounds can inhibit post harvest pathogens. For example, a 1973 paper reporting on the control of postharvest decay of fresh raspberries using acetaldehyde vapor found slight growth inhibition of *Fomes annosus* at 100 ppm acetaldehyde and complete inhibition at 500 ppm, and above. See

Prasad, K. and Stadelbacher, G. Plant Disease Reporter (September 1973) 57(9): 795-797 at 796. (A copy of this paper was attached to the Response to Office Action dated July 2, 2007.) Therefore, Applicant respectfully notes that inhibiting the growth of microbes that contaminate food, such as fruit and vegetables, using small amounts of volatile compounds is not unpredictable and is well within the skill of one of ordinary skill in the art.

As to point #2, above, Applicant notes that the claims, as amended, do not claim any and all microbes that contaminate containers of post harvest food, but rather *one or more* microbes that contaminate containers of post harvest fruit or vegetables. In addition, the specification provides examples of inhibition of growth of post-harvest food microbes, such as *Penicillium expansum* and *Sclerotinia sclerotiorum*, using volatiles obtained from Muscodor, including isobutyric acid. Further, the Mercier Declaration that Applicant submitted with the Response to Office Action dated July 6, 2006 describes use of compositions comprising isobutyric acid to inhibit the growth of *Penicillium expansum*, showing that with routine experimentation one can practice the claimed invention by following the teachings in the specification.

As to point #3, above, those of skill in the art would know how to apply the teachings of the specification to different containers containing post harvest food infected with microbes. For example, a 2001 paper regarding use of acetic acid vapor to control decay of stored apples describes the scale-up of small trials. In these small trials, apples contaminated with *P. expansum* were fumigated with acetic acid in fumigation chambers. (These fumigation chambers are simply more sophisticated versions of the sealed Petri plates described in the specification.) These small trial results were scaled up and acetic

acid applied to containers of post harvest food, such as standard wooden or plastic apple boxes, small wooden bins, and bags of apples. See Sholberg, P., et al., Fruits (2001) 56(5): 355-365. (A copy of this paper was enclosed with the office action of July 2, 2007.) Similarly, one of skill in the art, using routine experimentation, could apply the disclosures regarding isobutyric acid in the specification to various containers containing one or more microbes of interest.

As to point #4, through routine experimentation based on the disclosures in the specification, one of skill in the art would be able to determine an effective amount of the claimed composition needed to inhibit the growth of microorganisms. As described in a previous response to office action, Applicant has conducted routine experiments with the claimed volatile organic compound to determine the effective amount as to several microbes. See Declaration of Mercier submitted with Response to Office Action dated July 5, 2006.

In addition, the Prasad paper (1973), mentioned above, describes the variation of concentration of acetaldehyde vapor to determine an effective amount of the vapor to control decay on raspberries. Those of skill in the art would be able to determine effective amounts of the composition recited in the claims in a similar manner through routine experimentation. For all of the reasons presented above, Applicant requests reconsideration and withdrawal of the rejection for lack of enablement.

Rejection of Claims under 35 U.S.C. Section 102(b)

The Examiner rejected Claim 90 as being anticipated under 35 U.S.C. Section 102(b) in light of Tenuta (2001). To anticipate a claim under 35 U.S.C. Section 102(b), a

reference must disclose each and every limitation of that claim. The new claims are limited to use of the recited composition to inhibit growth of one or more microbes in post harvest food, wherein the food is fruit or vegetables. In contrast, the Tenuta reference is not directed toward post harvest food. In addition, the Tenuta reference only shows efficacy against Verticillium. Applicant respectfully submits that Verticillium is a soil-borne pathogen (as described in Tenuta) rather than a post harvest pathogen. Therefore, the claim amendments render this rejection moot, and Applicant respectfully requests its reconsideration and withdrawal.

The Examiner also rejected Claim 90, 92, 97, 98 and 99 as being anticipated by Freytag in light of Rengpipat and O'Reilly. The claims, as amended, are only directed toward post harvest fruits and vegetables. Because Freytag is directed toward cheese, it does not disclose each and every limitation of the amended claims and does not anticipate the claims.

In addition, the Freytag reference was directed toward a method for imparting an Italico-cheese flavour to a foodstuff and not to inhibiting the growth of microbes in cheese. If growth of microbes was inhibited by using this method, it was an unrecognized accident and, as such, does not inherently anticipate the claims. For example, the *In re Marshall* case (578 F.2d 301 198 USPQ 344 (CCPA 1978) involved a rejection, based on inherent anticipation, of claims to a weight control process comprising administering an anesthetic such as oxethazaine to inhibit release of hormones, thereby preventing release of pancreatic enzymes that would otherwise digest food passing through the digestive tract. The CCPA reversed the rejection, reasoning that

the cited reference, the Physician's Desk Reference, which disclosed use of oxethazaine for treatment of esophagitis, gastritis, peptic ulcer and irritable colon syndrome, was not anticipatory because it did not even remotely suggest taking oxethazaine to lose weight. The court noted that "if anyone ever lost weight by following the PDR teachings it was an unrecognized accident." Similarly, any inhibition of microbes in post harvest food through the process described in Freytag was an unrecognized accident. For the reasons outlined above the Freytag reference does not inherently anticipate the claims, as amended, and Applicant respectfully requests reconsideration and withdrawal of this rejection.

CONCLUSION

Applicant has enclosed a petition for a three-month extension of time to reply to the office action, along with a request for continued examination, and a check for \$1860.00 to cover the required fees.

In light of the above amendments and remarks, Applicant believes that each of the presently pending claims in this application is in condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejection of the claims and to pass this application to issue. The Examiner is invited to call the undersigned at the number provided below in order to discuss any aspect of this response.

Respectfully submitted,

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